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EFFECTS OF ENVIRONMENTAL POLICIES, STANDARDS AND REGULATIONS ON MARKET ACCESS AND COMPETITIVENESS, WITH SPECIAL REFERENCE TO DEVELOPING COUNTRIES, INCLUDING WITH LEAST DEVELOPED AMONG THEM, AND IN THE LIGHT OF UNCTAD EMPIRICAL STUDIES

Environmental policies, trade and competitiveness: conceptual and empirical issues

Report by the UNCTAD secretariat

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Summary

1. At its first session, the Ad Hoc Working Group on Trade, Environment and Development decided to include the following item in the provisional agenda for its second session: "The effects of environmental policies, standards and regulations on market access and competitiveness, with special reference to developing countries, including the least developed among them, and in the light of UNCTAD empirical studies".[1] This report has been prepared to support the discussion on the item. It is divided into three parts. Part A examines conceptual issues relating to the linkages between environmental policies and competitiveness. Part B draws on empirical studies undertaken under UNCTAD's technical cooperation programme on trade, environment and development, in particular country-specific studies carried out by research institutes in developing countries and countries in transition under the joint UNCTAD/UNDP project on "Reconciliation of environmental and trade policies" and the joint UNCTAD/UNEP project on "Capacity-building on trade and environment". The conclusions and recommendations are contained in Part C. A synthesis report of the empirical studies is being issued separately (TD/B/WG.6/Misc.4, English only).

2. The trade and environment debate has centred on the competitiveness effects of environmental policies. Such effects are determined by an evaluation of the costs and benefits of environmental protection. While protection of the environment is essential for both environmental and long-term economic reasons, such protection does not have infinite value. Therefore, environmental policies should be submitted like other policies to a rigorous cost-benefit analysis.

3. Such an analysis is difficult, in particular because of the problems involved in estimating environmental benefits in monetary terms. The valuation of these benefits also depends on social preferences which may differ across nations. The discussion on competitiveness in this report focuses on private costs of firms or sectors.

4. In both developing and developed countries the capacity of firms and economies to adjust to environmental policies depends on a number of factors. On the whole, it may be easier to adjust to domestic rather than external environmental policies, not least because the former already incorporate competitiveness concerns to a certain extent and tend to reflect more closely the environmental and other priorities of the country imposing these requirements. Implementing environmental policies may be relatively more difficult in developing countries than in developed countries for several reasons, such as inadequate infrastructural facilities, insufficient public funds and competing priorities for these funds. Nevertheless, developing countries are undertaking important initiatives to move towards higher levels of environmental protection.

5. Competitiveness effects may also differ between the short and the long run. While in the short run the competitiveness effects of environmental policies may be negative, in the long run they may be less significant or even positive. Dynamic effects are more likely to be positive when there are more possibilities for innovation.

6. Where increased costs of production are attributed to the fact that environmental standards are more stringent or better enforced than in other countries, competitiveness concerns may be seen to discourage the introduction of more stringent environmental standards. Compensating for the perceived competitiveness effects introduced by environmental policies may be questioned on the grounds that the latter are only one of the factors which influence competitiveness. In addition, as recognized by the Commission on Sustainable Development (CSD) there are legitimate reasons for diversity in environmental regulations across countries; and differences in the relative costs of production constitute the very basis for gains from international trade.[2] If all the factors which affect competitiveness are compensated for, then the international trading system may be severely affected. Moreover, it is unlikely that developing

countries would deliberately set lower standards in order to obtain short-term trade and economic advantages, as lax standards may imply higher abatement costs in the long run.

7. Eco-taxes and charges are likely to become increasingly important as part of a package of economic instruments used to address environmental problems. Border tax adjustments may be used to compensate for the competitiveness effects of domestic eco-taxes. The magnitude of their competitiveness effects and the extent of their use are ultimately empirical questions. Further research is needed to examine both the applicability of economic instruments such as eco-taxes in developing countries, as well as the trade and competitiveness effects of border tax adjustments.

8. Trade in domestically prohibited goods (DPGs) is another issue which is of concern to developing countries. Few countries have, however, made a rigorous cost benefit analysis of permitting the importation of DPGs, which should therefore form a subject of future empirical research.

9. Empirical research shows that for developing countries complying with specific environmental standards in external markets may be more expensive in relative, and sometimes even in absolute, terms than it is in the developed countries. This is because much of the investment in basic infrastructure has not yet been made and thus the cost of compliance for private firms is higher. The technology and the incorporated inputs required for meeting such standards may also not be readily available. Lack of administrative infrastructure may make it difficult to disseminate information on standards and on monitoring compliance.

10. Empirical evidence from the country case studies (see para. 1) has highlighted the importance of additional factors which have hitherto received little attention in discussions on competitiveness. For example, these studies show that it is more difficult for small firms to comply with environmental regulations and standards, both domestic and external, than it is for large firms. This is because small firms have greater difficulties in accessing information, inputs, and finance. Moreover, the economic use of some large scale environmentally sound technologies often requires a minimum scale of operation, which is beyond the scope of small firms. Environmental policies may thus need to specially address the concerns of small firms.

11. In addition, increased openness was generally found to facilitate compliance with environmental policies. However, increased openness will be more effective in mitigating adverse competitiveness of environmental policies if it is accompanied by other positive measures such as better access to markets, technology, and finance.

12. On Multilateral Environmental Agreements (MEAs), the little empirical evidence that exists suggests that their trade and competitiveness effects on developing countries could be significant. There is a need for a more detailed analysis of these effects, with a view to examining the adequacy of compensation mechanisms in existing and future agreements.

13. The competitiveness effects of external environmental policies and MEAs are conditioned by several factors, some of which are structural or systemic in nature. In general, the more open and dynamic the economy, the greater is its adaptability to external environmental policies. The sectoral composition of exports, level of government support, size of enterprises, access to information, availability of technology and inputs at reasonable prices and infrastructural development all have a role to play in determining the competitiveness effects of environmental policies. Thus, the main conclusion of this report is that it is difficult to measure the competitiveness impacts of environmental policies in isolation.

14. Environmental policies may be insufficient to generate environmental protection in developing countries, unless they are accompanied by economic

development. Public policy, both at the national and international levels, should ensure that environmental policies include the developmental dimension. National policies could be directed at fostering a climate of innovation, openness and capacity-building to promote the more effective implementation of domestic environmental policies. Measures to promote better market access, information sharing, as well as increased access to knowledge, technology and finance should be encouraged at the international level.

PART A: CONCEPTUAL ISSUES

I. INTRODUCTION

15. The interplay of trade and environmental policies today takes place in a complex scenario of changing output structures, high levels of unemployment in the OECD countries, rapid technological development and a multilateral trading system which encompasses issues such as foreign direct investment, intellectual property rights and trade in services. Additionally, the growing concern for environmental protection and sustainable development arises in the context of globalization, and significant trade liberalization. As a result, domestic policies, including environmental policies, may increasingly impinge on international trading and investment relations.

16. Questions have arisen as to whether initiatives by individual nations to protect human health and the environment through environmental policies affect international trade and investment patterns. For example, environmental policies could affect competitiveness if an industry in one country faced substantially higher pollution control costs than the same industry in other countries. This may also influence the location of the industry. Differences in domestic policies may lead to pressures either to harmonize them or to manage the trade that is affected by them.

17. The impact that these factors have on trade and investment will differ significantly according to whether environmental policies address production or consumption externalities.[3] As far as consumption externalities are concerned, the WTO Technical Barriers to Trade Agreement allows countries to extend domestic measures to imported products, provided they are enforced in accordance with WTO rules, including national treatment and non-discrimination. This treatment may significantly lessen, though not eliminate, the potential for friction among countries on account of competitiveness concerns. As far as production externalities are concerned, it is generally understood that WTO rules do not permit countries to impose domestic process standards on imported products. Process regulations may nevertheless raise costs for the producer and reduce the competitiveness of export and import-competing companies, and thus create trade friction on account of competitiveness concerns.

18. It has been argued that the implications for competitiveness of differing environmental standards are no different in principle from those of other policy differences across nations, including social or welfare policies. For example, the degree of government support for research and development and science education can influence the competitiveness of high-technology industries. Similarly, differences among nations in taxation policies towards saving and investment can influence the domestic capital stock and thus also the competitiveness of capital intensive industries. Where should the line be drawn if the competitive effects of various domestic policies were to become a source of demands for "levelling the competitive playing field"?[4]

19. There is also a school of thought which holds that environmental policies may actually enhance competitiveness, not only at the national, but also at the firm level. On the one hand, lax environmental regulations and standards may not enhance a nation's competitiveness, increase corporate profits, or protect jobs. When domestic standards lag behind those of other countries, inefficient domestic producers may be insulated from the need to innovate and invest in new equipment. Moreover, this would retard their long run competitiveness as well as the emergence of domestic producers of environmental goods and services, thereby allowing foreign producers to increase their competitive advantage.[5] On the other hand, stringent standards provide a country's industries with a stimulus to innovate.

20. Protecting the environment while raising living standards and maintaining competitiveness will require growth-inducing technological change, particularly in developing countries. Most new technologies use fewer inputs, including energy, per unit of output, and are less polluting than the old technologies they

replace. Much of the increasing environmental friendliness of newer technologies is induced by efforts to produce at lower costs and with greater efficiency. When economic incentives do not produce this result, public policy can create the incentive structures that ensure that technological change increases environmental friendliness.

21. The competitiveness effects of environmental policies in the case of developing countries are determined to a large extent by their ability to trade and to grow. Economic growth does not necessarily imply more of the same kind of goods, but it is in most cases compatible with new and cleaner products made by cleaner and more efficient processes. Trade, economic growth and the changes in production patterns should broadly be seen to include changes in products consumed; the processes by which they are made; the materials used by the production process; the energy sources used; infrastructural development; organizational structures of production; and the institutional economic framework.[6]

22. The extent to which environmental policies influence the international competitiveness of domestic producers is ultimately an empirical question. Existing evidence in most OECD countries confirms that the links between environmental costs and export competitiveness is on a par with that of capital, labour and research and development; and the effects of environmental costs on competitiveness have in general been small. Neither does available empirical evidence suggest that cost differences due to environmental standards have significant effects on the relocation of industries.[7] The experience of developing countries in this context is relatively limited (see chapter V). However, the effects of environmental policies on the competitiveness of developing countries may be somewhat different from that of the OECD countries.

23. It is to be noted that some of the issues examined in this report, such as environmental taxes and charges and trade in domestically prohibited goods, are also being discussed in other international organizations such as the WTO, UNEP and OECD. This report briefly examines the competitiveness aspects of such policies on developing countries. Such effects may be further analysed in the light of the information forthcoming from empirical studies carried out jointly with UNEP and UNDP.[8]

II. FACTORS AFFECTING COMPETITIVENESS

24. In conceptual terms, the environment-competitiveness relationship has often been thought of as a trade-off. On the one hand are the social benefits that arise from adherence to strict environmental standards, on the other hand are the costs of complying with them. There is widespread disagreement about the size of the social and economic benefits, e.g the improvement in public health from phasing out particular substances or the increase in life expectancy from a given reduction in pollution. Although the issue of valuing social benefits is an important one, because the benefits are difficult to measure, the discussion on competitiveness in this report will focus on private costs of firms and sectors.

25. The costs of complying with environmental regulations can be separated into their fixed and variable cost components. Properly designed environmental policies can induce firms to use less material and energy inputs, resulting in reduced variable costs. In some cases, however, if compliance with environmental policies results in increased costs of raw materials or increased labour inputs, then variable costs may be higher. Even in these cases variable costs may decline over time due to learning and innovations in compliance methods. Fixed costs, while high in the short run, may decline as they are amortized over the life of the project.

26. Competitiveness effects at both the firm and the national level may change over time. At the firm level, the difference between static and dynamic effects arises largely because innovation can lead to cost savings in the long run. In addition to innovation, government policies -particularly with respect to

investment, infrastructure, education and awareness building- can also have positive effects on competitiveness in the long run.

27. In a dynamic situation, technologies can change, raw materials and finance can be better sourced and markets for environmentally friendly products can be developed. In addition, environmental regulations and standards can induce innovation, thus at least partially offsetting the costs of compliance. Thus, strict regulation can be better for competitiveness than lax regulation in the long run. However, this positive correlation will only hold if regulations are properly crafted and companies are aware of the possibility that such regulations may be imposed.

28. Innovation can be defined broadly as the ability to improve a product or its performance, its production process, its marketing and how it is advertised. In the context of international trade, competitiveness arises from innovations that anticipate international needs while at the same time addressing local needs.

29. Innovation effects at the product level can include better performing or higher quality products, e.g energy-efficient household appliances. They can also lower the costs of using or disposing of a product, e.g recyclable paper. Innovation benefits at the process stage could include raw materials savings, conversion of waste into valuable by-products, and reduced costs of waste transportation and disposal.

30. On the conditions for fostering innovation, two kinds of views have been expressed: first, that governments should provide broad "enabling" conditions, but leave the market free to generate innovation and its diffusion. The second, while accepting the importance of free markets, sees the government taking a more active part in innovation. How these two strategies are pursued to foster innovation or adaptation at the sectoral level depends in part on the export competitiveness of products generated through innovation. The export-oriented, newly industrialising countries, for example, tried to test the success of their innovation strategies through a process of selective government support. Products unable to compete internationally had their assistance cut off.

31. Competitiveness effects of environmental policies are also influenced by the process of standard setting. The main actors involved are central and local governments, industry and consumer or other non-governmental groups. Evidence suggests that while standards may be set by any of these three groups, the design of standards is more likely to be carried out by the industry rather than by governments. This is because bureaucrats alone often do not have the technical competence to develop standards and may need to rely on industry's knowledge of feasible standards.[9] Thus, while the competitiveness effects of domestic standards are not significant those of external standards could be more important.

32. While this chapter has analysed some of the factors affecting competitiveness at a broad level, it is useful to examine some specific policies, their possible effects on competitiveness and measures used to alleviate these effects. The next chapter thus examines the issue of eco-taxes and their competitiveness implications. Environmental standards and regulations have been examined in greater detail in reports TD/B/40(1)/6 and TD/B/41(4). Other newly emerging environmental policy instruments with a trade impact will be examined by the Working Group at a later stage.[10] The issues of environmental taxes and trade in domestically prohibited goods which have been briefly analysed in this report could be further studied in the context of the country case studies being undertaken under the joint UNCTAD/UNDP and UNCTAD/UNEP projects. The results of such empirical analysis could provide useful inputs to the deliberations on these issues in other fora.

III. ECO-TAXES AND BORDER TAX ADJUSTMENTS

A. Eco-taxes

33. Economic instruments such as eco-taxes or environmental charges are being increasingly used as a tool to address environmental problems. Economic instruments are often considered to be preferable to regulations as they are more flexible and potentially more cost-effective. Environmental taxes and charges can be levied either on the product (indirect tax) or on the process (direct tax).[11] For example, Sweden has been using indirect environmental taxes for a range of products including batteries and fertilisers, while direct taxes have been imposed on sulphur and nitrogen oxide emissions.

34. Domestic taxes are likely to have competitiveness effects because, pursuant to the imposition of a tax, domestically-produced items become relatively more expensive than competing products in foreign markets, and more expensive than competing imported products in the domestic market. This may delay the introduction of taxes, unless they can be adjusted at the border. A border tax adjustment consists of the imposition of a charge on imported products corresponding to the tax borne by like domestic products, and the exemption from or remission of taxes on products to be exported.

35. WTO rules allow the border adjustment of taxes only on final products, and possibly on inputs consumed in the process of production,[12] but prohibit (or are ambiguous with respect to) taxes on some non-physically incorporated inputs and processes. Taxes which can be adjusted at the border may be preferred for competitiveness reasons to those which cannot be so adjusted, e.g a process tax.

B. Border tax adjustments

36. In the case of taxes designed to address environmental effects at the consumption or disposal stage, the impact would be enhanced if it were applied to all products, including imported products, being consumed and disposed of in the domestic market. In this case, domestic taxes should be applied to imports and could be rebated on exports. These border tax adjustments are consistent with WTO rules, provided that obligations relating to transparency, most favoured nation (MFN) and national treatment are met.

37. In the case of taxes aimed at addressing environmental effects at the production stage, the environmental effectiveness of border tax adjustment is less clear. From the domestic point of view, environmental taxes which aim to change production behaviour are generally more effective if they are levied as far upstream in the production process as possible.[13] This means that it will in general be better if the tax is levied on the production and extraction process causing the environmental problem rather than on the resulting product.

38. However, when applied in the context of international trade, it is less clear that the desired environmental benefits will result from border tax adjustments. If the reason for imposing a tax is to discourage a particular process or use of an input domestically, then depending on the share of exports in total production, remitting export taxes could defeat the purpose of the tax, and imposition of the tax on imports may serve little purpose.[14]

39. Border tax adjustments for domestic process taxes could serve two purposes: (1) to encourage a change in environmental behaviour of foreign producers; and (2) to respond to concerns of domestic producers who have incurred environmental costs as a result of process taxes that they not be disadvantaged vis-a-vis foreign producers. The first alternative could be viewed as extraterritorial imposition of domestic environmental standards. Compensating for competitiveness effects of firms can be questioned on the grounds that it is not clear that higher environmental compliance costs alone have a critical impact on competitiveness, and that there are many other cost elements that account to a greater extent for differences in competitiveness, including those that reflect national values and choices.

40. Another concern with respect to border tax adjustment arises where imported products were subject to product or process regulation, rather than taxes, in the country of origin.[15] In this case, the product already bears additional costs from complying with applicable regulatory requirements which cannot be adjusted at the point of export. The question that arises is whether and to what extent the product should then be subject to further taxes in another country merely because its country of origin chose to use regulation rather than fiscal measures. Such a consequence may encourage countries to adopt fiscal measures in place of regulations, which may not always be desirable from an environmental point of view, particularly in developing countries.

Conclusion

41. Applying border adjustments to environmental taxes, particularly process taxes, raises a number of problems which have been discussed above. Further research is needed on the effects of border tax adjustments on the export competitiveness of developing countries. It is also necessary to analyse whether such taxes and their adjustment at the border would help address environmental problems in developing countries. An additional issue which must be addressed in this context is to what extent it is administratively and economically feasible to use economic instruments for environmental purposes in developing countries.

IV. TRADE IN DOMESTICALLY PROHIBITED GOODS (DPGs)

42. While environmental policies have raised various kinds of trade and competitiveness concerns, trade in certain kinds of products, such as domestically prohibited goods (DPGs) may by itself exacerbate environmental problems. In this situation there are two options: (a) to ban trade in such products and (b) to investigate options by which trade in such products does not have harmful environmental consequences.[16] Keeping these two options in mind, this chapter examines the issue of trade in domestically prohibited goods.

43. Developing countries have raised concerns with respect to the export, in particular by developed countries, of goods prohibited for sale in the domestic market of the exporting country. Importing countries often do not know that a specific product being imported is prohibited for sale in the domestic market of the exporting country. Also, exporters may at times make false declarations or include prohibited products among permitted ones. In addition, testing facilities in many developing countries may be inadequate. Further, the absence of consumer protection regulations in a number of developing countries may result in the marketing of products which cannot be sold in the market of the country of origin.[17]

44. In addition, developing countries may not have the capacity to handle DPGs or be unable to absorb the associated health risks, and thus favour a ban on the trade of such products. In this context, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal contains a number of provisions which could usefully be analysed.[18]

45. Another problem which arises in the case of developing countries is that of export. For example, a case study reports that when Colombia imported sodium bisulphite from the United States (which was banned in the United States), it was unable to export shrimps washed with sodium bisulphite to the same country. With better information, Colombia's decisions might have been different. Similarly, chemicals which are prohibited for sale in developed countries may be imported for reexport to third countries without any prior notifications to these countries.[19]

46. At the same time, however, goods that are prohibited in one country may be safe in another, due to different circumstances (climate, geographical conditions and other factors). Furthermore, industrial processes in the importing

country may use goods which are domestically prohibited in the exporting country. Thus outright export bans may not always be desirable both from the point of view of the exporting and of the importing country.

47. Trade in DPGs can result in allocative efficiencies, but there may be a need to demonstrate that compensation for possible health and other damages is feasible. If such compensation and liability coverage by exporters of DPGs can be provided, both from an economic and an environmental point of view, then trade in DPGs may not be harmful.

48. Importing countries need to consider the costs and benefits of allowing imports of goods which are domestically prohibited in the exporting country. However, such an exercise will be difficult without complete information on the prohibited goods and technologies and the reasons for their prohibition. Binding obligations on notification of such products and technologies as well as adequate financial and dispute settlement provisions could help in improving the exchange of information. The use of prior informed consent procedures may also be an important initiative in this direction. In this context, it is worth noting that FAO and UNEP established a joint programme for the implementation of Prior Informed Consent(PIC) in 1990.[20] Apart from notification to WTO contracting parties, additional notification at the point of sale under prior informed consent procedures may be needed.[21]

PART B: EMPIRICAL ISSUES

V. ENVIRONMENT AND COMPETITIVENESS: A DEVELOPING COUNTRY PERSPECTIVE

49. In surveying the competitiveness effects of environmental policies and consumer demand two scenarios arise: (1) the effects of domestic policies, and (2) the effects of policies in external markets. This chapter draws upon the empirical studies undertaken under UNCTAD's technical cooperation programme on trade, environment and development, in particular country-specific studies, as well as on a synthesis report on a number of country case studies.[22]

50. The chapter examines a number of factors which have an important bearing in determining the effects of environmental policies on competitiveness. Some of these are structural in nature while others are case-specific. The structural factors are, for instance the rate of growth of an economy, its degree of openness, the level of its infrastructural development and the composition of its exports. Specific factors could include availability of raw materials, the size of firms and the capacity to innovate.

A. Competitiveness effects of domestic environmental policies

51. Generally speaking, domestic environmental policies have had smaller effects on competitiveness than have foreign environmental policies. This can be attributed to several reasons. Domestic standards tend to respond to domestic environmental concerns and are often developed in cooperation with the industrial sector. To this extent, they already incorporate competitiveness concerns and the required technology is likely to be available domestically.

1. Domestic concerns

52. Empirical evidence suggests that, with a few exceptions, when environmental regulations responded to domestic concerns, their competitiveness effects were relatively small. In some cases, domestic regulations were more stringent than external ones. The effects of domestic policies might, however, be more significant for unprofitable firms, or where domestic legislation responded primarily to external requirements.

53. Governments in developing countries are moving towards higher environmental standards. One way of implementing higher standards is through requiring new investment to meet stricter environmental regulations. In a number

of countries, obtaining licenses or loans is conditional on compliance with environmental regulations. For example, the case study on Argentina attributes the good environmental practices of a number of firms in the paper industry to the fact that at the time of their establishment, special environmental requirements existed as part of Argentina's industrial promotion policy, or as a condition to access to preferential and foreign loans.[23] In Brazil, the National Bank for Economic and Social Development (BNDES) not only requires that new industrial projects comply with legal environmental requirements, but also offers lines of credit to support pollution abatement programmes.[24]

54. In the Philippines, an economy-wide study found that pollution abatement costs as a percentage of total costs was less than 1 per cent for 51 out of 61 sectors. The only sectors where this cost exceeded 2 per cent were: public administration and defence, poultry and poultry products, forestry, agricultural crops, livestock and livestock production and electricity. More detailed case studies show that some firms (those with costs above the average) may be affected in selected sectors. These include aquaculture and fish processing. Apart from these sectors, it appears that local environmental standards would not have a significant impact on overall sectoral competitiveness.[25]

55. The above examples show that the introduction of more stringent environmental standards need not result in adverse competitiveness effects, provided that firms are attuned to this possibility. However, the study on Poland found that there are likely to be more serious export losses resulting from changes in domestic environment and environment-related regulations. For example, the effects of the increase in electricity prices is conjectured to affect the export of the following energy intensive goods: fertilizers, plastics, organic chemicals, metal products and building materials. Moreover, as part of market reforms, prices of both raw materials and energy have risen sharply in Poland. Hence, many exports characterised by a high content of raw materials and energy are likely to be affected. While these reforms have impacted positively on the environment, they have contributed to a loss of international competitiveness. One positive aspect of the stricter environmental regulations is the development of a pollution control industry in Poland, which may also be able to export to other transition economies.[26]

56. The study on Brazil indicated that restrictions imposed from outside the country were not the main reason for the implementation of stringent environmental standards, as was observed in the case of the forest policy established by the Government of the State of Minas Gerais. In fact the costs and difficulties of meeting environmental standards dictated by the national forest policy far exceeded those put in place by the external markets for pig iron producers.[27]

57. The study on India indicated that the costs of domestic compliance differ from those of compliance with international standards. For the leather sector, cost increases in leather and leather products resulting from domestic pollution abatement rules were estimated on average at 1.5 percent. However, this could be onerous for small producers, as it covers a substantial fixed cost component. Compared to the cost of meeting external standards, however, it is tiny. That cost is 300 percent, most of which is presumably recovered from a higher sale price.[28]

58. In Turkey, the domestic market enterprises interviewed made the interesting point that stricter national standards would actually benefit them because: (a) they were currently facing different standards in the home and export markets and this was adding to their costs; and (b) producers in other developing countries were selling goods in the Turkish market that met the lower standards, thus making it difficult for local producers to compete in price with imports.[29]

2. Industrial restructuring and openness

59. Industrial restructuring for improving production efficiency may also result in environmental improvements, provided that costs are reduced in the

process. However the process of industrial restructuring could also be accompanied by rising costs and decreasing competitiveness. In this case firms will be less inclined to invest in environmental improvements. Increased openness will generally make it easier to access raw materials and technologies, thus reducing the competitiveness effects of environmental policies.

60. The experience with industrial restructuring in Poland's steel industry indicates that while reducing capacity, it will also reduce environmental damage by 70-80 percent. Those plants that are left will be more efficient, with production costs down by $20-25/ton. The effect of openness in the context of the Polish economy may, however, make it difficult to mitigate the adverse competitiveness effects of environmental policies.[30] Given that the country has set a target of achieving European Union membership within 10-12 years, it is likely that many local producers will not be able to meet the required standards and, therefore, be unable to export (or even produce for the home market). At the same time, the decision to seek membership to the EU, and the time period over which to phase in the stricter standards, have been taken by the Polish government and cannot be said to have been imposed from outside. It is also worth noting that the cost of meeting the standards is not fixed, but is a function of the policies implemented to bring about the higher standards. The use of market-based instruments could help to substantially reduce these costs.[31]

61. A study on Argentina's paper industry shows that in response to trade liberalization and the associated industrial restructuring process, a number of medium-sized enterprises have achieved certain improvements in environmental performance as a result of their efforts to achieve higher production efficiency.[32] Examples are the recovery of fibres in paper mills and higher efficiency in the use of energy and water. Many firms now possess installations for the primary treatment of effluents, which in various cases were installed or improved during the restructuring process. There has also been an increase in the use of recycled materials with a view to reducing costs, in particular in the case of the packaging industry. However, environmental improvements which do not reduce costs, e.g secondary effluent treatment or reduced air pollution, have been less frequently implemented by firms.

62. Increased openness in China led to the adoption of environmentally sound technologies (ESTs) partly in response to foreign requirements of product quality, which have resulted in both reduced wastes and in increased profits for the enterprises operating them.[33] These include a cement plant in Quju and a valve plant in Tanjing among others. The examples above show that increased openness and the consequent competition results in a better climate for innovation.

B. Compliance with external environmental policies

63. Environmental regulations on products are relatively scarce, and are concentrated in sectors such as food, tropical timber products, chemicals, textiles, paper products and products containing hazardous substances. Nevertheless, consumer preferences for environmentally friendly products, though not uniform across markets in developed countries, may have competitiveness effects. Therefore, the competitiveness effects of external environmental requirements depend to a large extent on the composition and destination of exports. If a large share of exports comprises environmentally sensitive products, then regulations and standards are likely to have a more significant impact on competitiveness; and if export markets are large, there is a greater incentive to improve environmental standards of products. Other factors which will affect the competitiveness of firms include access to information, availability of raw materials and technologies, infrastructural facilities and firm size.

1. Composition and destination of exports

64. The larger the share of exports of products which are sensitive to environmental regulations the more is the overall export performance of a country

likely to be affected. However in fast-growing economies some of the negative competitiveness effects can be diffused through a concerted effort at export diversification, both of products and of markets. Environmental regulations on inputs may also have an impact on the competitiveness of the final product, even though there may not be regulations on the final product themselves.

65. In Colombia, a survey of exporting firms showed that 63 per cent had not perceived or experienced major competitiveness effects of international environmental standards; only 16 per cent said they had. This is partly explained by Colombia's trade pattern. The European market is not the most important one for Colombia; Germany, for example, which has stringent standards, accounts for only 2.4 and 7.6 per cent of Colombia's non-traditional and traditional exports, respectively[34].

66. Export growth in Argentina and Brazil is largely based on products which use natural resources and energy intensively. Although the cost of pollution abatement in these sectors is high, being dynamic sectors the competitiveness effects have not been significant. The studies also suggest that participation in international markets may prompt increased care with environmental variables.[35] For example, the Argentina case study suggests that packaging requirements have affected producers of carton boxes directly (a large share of exports go to developed country markets) and indirectly (among the principal clients of the sector are exporters of fruit and manufactured food to the European markets). Environmental improvements have thus been made as a consequence of the export orientation of the sectors concerned.

2. Cost structure

67. If export competitiveness is based on being able to sell cheaply, e.g labour intensive products such as textiles and footwear, then regulations and standards which lead to any cost increase are more likely to have an adverse effect on competitiveness. For example, packaging regulations may have more significant effects on competitiveness in the case of low value added products, such as fruit and vegetables, than they do on high value added products. Similarly, input price increases arising from compliance with external environmental regulations will affect competitiveness adversely. On the other hand, in the case of policies such as eco-labelling, which are based on product differentiation, price-based competition may in some cases insulate producers from the competitiveness effects of such policies.[36]

68. In the case of commodities, a large proportion of the cost would be accounted for by the cost of raw materials, and thus competitiveness effects of environmental regulations may be significant. For example, the case study on Colombia suggests that in a situation of falling world prices, internalizing environmental externalities would put several small coffee producers out of business. In Jamaica the Government was unable to impose higher environmental standards on alumina producers because of falling world prices for alumina.[37]

69. The cost of inputs may be an important element in determining the effects of environmental regulations on the competitiveness of the final product. For example, bans on pesticides or some kind of dyes will not only affect the dyestuff or chemicals industry, but will also have far wider implications for exports of food as well as of textiles and garments. A study in India has shown that a ban on the use of benzidine dyes is likely to double the cost of dyes, affecting the competitiveness not only of the dyestuff industry but also of the textile industry. This is because some 60 per cent of the dyeing costs of fabrics is attributed to the raw material costs. Similarly, bans on certain pesticides and chemicals are likely to affect approximately 60 per cent of India's exports of food products to the OECD countries.[38] The above example shows that the availability of specialized inputs has an important bearing on the competitiveness effects of environmental policies.

70. The availability of raw materials and technologies would also have a bearing on the cost of compliance. For instance, cleaner products and processes

may entail the substitution of imported raw materials for domestic raw materials, particularly for industries which use chemicals as inputs, such as textiles and footwear.[39] Approximately half of the manufacturing companies surveyed in Turkey found that compliance with environmental requirements would necessitate the import of raw materials and intermediate goods, often at higher cost. Similarly, cleaner technologies may not be readily available domestically or installing them may require scrapping existing facilities. The report on eco-labelling (TD/B/WG.6/5) also shows that obtaining an eco-label may be made difficult because of a lack of appropriate raw materials and chemicals.[40]

71. Competitiveness effects are more pronounced according to whether the standard or regulation requires a change in the process or technology. Even if the regulation is product related it may require a change in technology, which may be expensive. In addition, even if there are no mandatory process regulations, importers may nevertheless request the use of specific PPMs. This may require a change in technology and thus have an impact on export competitiveness.

72. An example of how product standards may require changes in technology and investment is given in the study on India. Adhering to eco-standards for a single blue dye would require an investment of US$ 13m in the case of some leading firms. This is because producing this dye would require upgrading the technology, including establishing secondary treatment plants in order to obtain the requisite quality, and investment in automation control instruments to monitor the area-to-fuel ratios and carbon-dioxide emissions. Even where imports of technology are not required, additional know-how and imports of chemicals to meet product standards may be high.

73. In Turkey, it was found that exporters accepted that foreign clients would specify the processes to be adopted and often worked closely together with their clients. The necessary technology was mostly available domestically and the volume of exports was unaffected by the imposition of stricter regulations in the European Union.[41]

3. Structural factors

74. Other structural variables play a large role in determining the adjustment capacities of firms or sectors to external environmental regulations, and therefore affect competitiveness. These include import tariffs, relationship with foreign firms, price structure and factor composition.

75. For example, Indian exporters have reported that the PCP ban in the German market raised the cost of tanning leather. By contrast, the Argentina case study reports that producers did not find their costs increasing significantly in response to the PCP ban. There are several structural factors that could have contributed to this difference, among them being Argentina's trade liberalization policies, which made imports more accessible. In contrast, India's tariff regime may have made the importation of the substitute chemical more expensive.[42]

76. Similarly, studies on the agricultural sector in India show that internalising externalities may require structural changes in farming patterns. For example, in the district of Ludhiana, the predominant rice/wheat farming system can be made more environmentally friendly and more economical, but that would require pricing reform, improvements in water management, an alternative cropping system and better monitoring of the ground water problem. This would require government intervention and support.[43]

77. In Jamaica, the Natural Resources Conservation Authority (NRCA) in 1991 introduced interim standards on air and water quality. However, NRCA faces several challenges with respect to their implementation. At a time when public expenditures in general are declining due to structural adjustment programs, it

is very difficult for the national government to mobilise funds for environmental expenditures. Moreover the NRCA does not have the necessary personnel or machinery to monitor the compliance of companies with environmental standards. This is particularly the case for the alumina and bauxite industry.[44]

78. With regard to the competitiveness effects of linkages with foreign firms, the study on Argentina indicates that subsidiaries of transnational corporations or companies otherwise linked to foreign enterprises have also introduced substantive changes in environmental management. For example, the principal producer of special papers allocated 25 per cent of its planned investment to environmental protection equipment and, following instructions from the mother-company, is importing totally chlorine free pulp for all its products.

79. Lack of infrastructural facilities may make it difficult to comply with environmental standards. Moreover, the competitiveness effects of higher environmental standards would be partially mitigated by improvements in infrastructure.[45] This is supported by a World Bank study which has estimated that only about 15 per cent of the costs needed annually for sustainable development in developing countries would be for industry, assuming that developing countries would reach comparable environmental standards to those of the OECD countries in 15 years' time.

4. Firm size

80. Size has an important influence on the ability of a firm to implement environmental standards and regulations. Investment in environmentally friendly technologies may be easier for large rather than small firms: large firms may also find it easier to access finance, information and raw materials.

81. For example, a study on India's textile industry shows that only large companies have primary and secondary level effluent treatment facilities and pollution monitoring units. Small firms are more vulnerable because their awareness of eco-standards is low and there is insufficient knowledge about chemical inputs. In addition, environmental investment in effluent treatment plant, for example, requires a minimum scale of operation. The study has also estimated that approximately 70 per cent of India's exports of cotton fabrics and garments to Europe (primarily by small firms) may be affected by eco-standards.[46] Additionally, it has also been estimated that meeting eco-standards in most of the major markets may increase fixed costs by about 10 per cent and variable costs by 15 per cent at the firm level. This may have significant effects on competitiveness in view of the fact that profit margins in the highly competitive textiles sector are not very high.[47]

82. A study on Argentina's paper industry shows that small firms, which generally use old equipment and out-dated technologies, often have a more serious environmental impact than large firms. Small firms tend to be located in or close to urban areas. It is more difficult to improve the environmental performance of these firms due to their limited financial capacity and space (i.e the small size of industrial sites complicates the installation of water treatment facilities). For many small firms, for example, it is not economical to recover chemicals. Large investments may also be difficult to justify since older factories tend to be completely written-off. Also, size makes technological adjustments easier and more economical.

83. On the other hand, it has been argued that small and spatially dispersed polluters cannot be treated with the same sense of urgency that large firms should be. Infrastructural improvements may also be needed more urgently for small firms than for large firms. For example, better municipal waste water treatment facilities may reduce the costs of treating water effluents for small firms.

5. Information, awareness, and transaction costs

84. Efforts to analyse the effects of environmental policies in OECD countries on exports of developing countries are rendered difficult by a number of factors. In many developing countries there is scant information on the existence of such standards among the producers, much less about their effects on exports.

85. Obtaining information about changes in regulations and the fact that they vary from country to country can have significant effects on competitiveness. In India, examples of industries that have been affected by differing foreign regulations are motor vehicles and pharmaceuticals. In this case different technologies and production runs were required to meet differing environmental standards across markets.[48] As with India, exporters in Turkey found some loss of economies of scale in meeting the requirements of different markets.[49]

86. In the case of packaging, the uncertainty related to packaging regulations has had an impact on trade (see TD/B/41(1)/4). Changing regulations may also increase the costs of obtaining information and the costs of exporting to different markets.

6. Conclusions

87. One conclusion that emerges from the empirical studies is that many developing countries are implementing increasingly stringent environmental regulations and standards, thus reducing the scope for trade friction. In some cases, these standards may be more stringent than those of their OECD trading partners. As in the case of developed countries, domestic environmental regulations appear to have generally had relatively small effects on competitiveness of firms in developing countries.

88. Competitiveness tends to be relatively more affected by the environmental regulations of trading partners. Open economies have greater scope for reducing the competitiveness effects because of better access to information, inputs and technology. On the other hand, openness increases import competition which may lead to negative competitiveness effects unless the firms themselves are dynamic and are able to expand their markets.

89. The competitiveness effects of both domestic and external environmental regulations may differ between small and large firms. Studies indicate that large firms have been little affected in comparison with small firms. This suggests that the need to comply with external environmental standards may have some effects on the level of industrial concentration. This differential effect also indicates that governments may have to introduce specific measures to promote adaptation and innovation in small firms. They may also have to use special assistance mechanisms for disseminating information, including on raw materials, and research into cost effective means for mitigating the competitiveness effects of environmental standards and regulations. International efforts could also be specifically directed at alleviating the competitiveness effects on small firms in developing countries.

90. Most of the case studies show that economies which are stagnant are less able to implement environmental standards. Even if there are significant sectoral effects, growing economies have more options for moving towards compliance with stringent standards because the negative effects in some sectors may be compensated by the growth of other sectors. Economic growth goes hand in hand with increases in capital stock, and it is easier to install cleaner technologies when new investments are being made. In addition, in growing economies the possibilities of innovation are likely to be higher as are the chances of mitigating adverse competitiveness effects in the long run.

91. Improvements in infrastructure can also play a vital role in reducing the costs of compliance, particularly for small firms. For example, improved infrastructure will reduce the cost of compliance with water effluent standards

as part of the expense would be borne by municipalities which install waste water treatment facilities. Better sanitation and education would also reduce the costs of compliance with environmental policies.

VI. MULTILATERAL ENVIRONMENTAL AGREEMENTS (MEAS) TRADE AND COMPETITIVENESS

A. Introduction

92. There is a high level of consensus that global environmental problems should be tackled through internationally agreed measures under Multilateral Environmental Agreements (MEAs). In the case of issues such as greenhouse gases, ozone depleting substances (ODSs), or the conservation of threatened species, MEAs are essential. Principle 7 of the Rio Declaration states that "in view of the different contribution to global environmental degradation, States have common but differentiated responsibilities". Technical and financial assistance has been incorporated into a few MEAs. In some cases trade measures have also been written in MEAs, but only to be used as a last resort in the event of non-compliance. Of the 180 MEAs negotiated, only 18 provide for the use of trade measures, including the Montreal Protocol on Substances that Deplete the Ozone Layer, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal and the Convention on International Trade in Endangered Species (CITES). Available evidence on the effects of MEAs on trade and competitiveness is limited to only a few agreements such as the Montreal Protocol. Thus most of the empirical evidence used in this chapter relates to the Montreal Protocol.

B. Trade effects of MEAs

93. Some evidence of the trade effects of the Montreal Protocol suggests that while total OECD imports of products included in Annexes *I-E* of the Protocol declined between 1989 (the year the Protocol was signed) and 1993, imports of these products from some developing countries have increased. Exports of products containing controlled substances from the OECD to the rest of the world have, however, remained constant. This suggests that there may have been some relocation of production facilities to some developing countries, although not necessarily as a consequence of the Montreal Protocol.

94. As ODSs are being phased out, developing countries that export products using such chemicals (such as refrigerators) are finding that their markets are being squeezed as buyers want to shift to versions based on substitutes, which may require additional investment and new technology. However, the stipulations of the Protocol helped one Chinese company to increase its exports of freon-free air conditioners, while exports of refrigerators declined by 58 per cent between 1988 and 1991. Other adversely affected export items from China include air conditioners with refrigerants, cleaning articles with blowing agents, chemical products and some miscellaneous organic and other products.[90] It is as a consequence of this decline that China has stepped up its phase-out program faster than would be required for developing countries under the Protocol.[91]

95. The effects on exports also depend on the products which are being exported. For example, in the Philippines, MEAs have had no significant effect on exports. However, an agreement on trade in tropical timber would impact significantly on the country's exports of furniture as local sources of sustainable timber are very few. On the other hand, some MEAs would actually benefit the Philippine's exports. MEAs regulating driftnet fishing, such as the 1989 Wellington Convention for the Prohibition of Fishing with Long Driftnets and the UN Moratorium on Driftnet Fishing, are good examples as driftnet fishing is not widely practised in the Philippines.[92]

96. In the case of Poland, it is premature to estimate the influence of international treaties on trade as its participation in most treaties dates only to 1990. Nevertheless, it is possible that both the Montreal Protocol and the Climate Change Convention may have an impact on Poland's foreign trade, either through the increased cost of the technology that replaces ODSs, or because of the loss of export markets for fossil fuels, particularly coal.[53] Furthermore, the Basel Convention that controls the transboundary movement of hazardous wastes has major trade implications for Poland. On the one hand, it has resulted in a major reduction of imports of wastes, where some of them (e.g. scrap paper) are often used as inputs in production processes. On the other hand, the domestic industry using scrap metal may have benefited from export restrictions. Finally, Poland is losing out in economic terms from this treaty through the loss of transport business (Poland is a corridor for the shipment of materials from Russian Federation and Ukraine).

97. Zimbabwe derived some environmental benefits arising from the Bamako Convention, which restricts the import of wastes into Africa and controls the transboundary movement of wastes within Africa. On the other hand, the CITES appears to have been of doubtful environmental value to Zimbabwe. This is primarily because of the ban on trade in ivory, which hurts Zimbabwe, where elephants are not endangered and which could gain significantly from exporting ivory. In fact the revenues from such trade could provide much needed resources for managing elephant habitats. For Zimbabwe, this issue has been a major source of disagreement within CITES.[54]

C. Competitiveness effects

98. The competitiveness effects of MEAs are more difficult to estimate than the trade effects. As ODSs have to be substituted, competitiveness effects will depend on the price of the substitute and whether the countries themselves produce ODSs. For countries which import ODSs, these imports are likely to become more expensive as the production in OECD countries declines. Switching to substitutes may also be more expensive depending on their relative prices. For countries which produce ODSs, the replacement of the controlled substances may require a major change in the production process or the installation of a new technology, which may or may not be domestically available. However, except for firms which produce CFCs, entire recapitalization seems to be the exception (for example, refrigeration and air conditioning).

99. The competitiveness effects of the Montreal Protocol on the refrigeration and air conditioning industry have been examined in a study on India.[55] In tropical countries such as India, since food preservation and drug and pharmaceutical manufacture all use refrigeration, the use of CFCs assumes a critical role. More importantly, at the time of signing the Protocol many of the plants used for manufacturing CFCs were relatively new and had not completed their payback periods. Moreover, the use of CFCs is higher in life-supporting sectors such as drugs and pharmaceuticals, as compared to air conditioners. Thus, given the social importance of the sectors involved, the room for adjusting or cutting down on the use of CFCs is relatively limited.

100. The cost of compliance with the Montreal Protocol will be felt by several sectors of the Indian economy. The competitiveness effects are felt not only by the producers of controlled substances, but also by the manufacturers of products using such substances. Research and development costs will also increase, as well as the cost of products using refrigeration. An early phase-out strategy by 1999 would be less costly for India as the costs would be mostly borne by the producers of ODSs and not by the users, either directly (e.g refrigerators) or indirectly (e.g food). In the late phase-out by 2010, most of the cost would be borne by the users rather than producers. On balance, a late phase-out may be more expensive.

101. There are several estimates of the costs of adjusting to the requirements of the Montreal Protocol, both for an early and a late phase-out. The costs estimated by the World Bank were US$ 320m and US$ 482m, respectively. However,

a Task Force set up by the Indian Government has estimated that costs could be as high as US$ 1.4 billion and US$ 2.4 billion, respectively. This is at least four times the size of the entire Multilateral Fund under the Montreal Protocol.[56] However, it should be noted that alternative technologies and substitute chemicals are likely to be less expensive over time. This may not have been reflected in the estimates provided by the Task Force.

102. At the sectoral level, a study on India has estimated that the adjustment cost of adopting new technology is about 30-35 per cent of total costs for refrigerators and about 5-10 per cent for air conditioners. Some of the problems that producers face in adapting to the Montreal Protocol include the difficulties in obtaining information on new CFC-free technology available in OECD countries. The problem of obtaining the appropriate technology is further compounded by the fact that these technologies are rarely tested in tropical conditions, and thus although an early phase-out would be more desirable from an economic point of view, whether such a strategy will prove feasible is more doubtful. This depends on the research and development capacity in India itself, and on the feasibility of developing indigenous substitutes for CFCs.[57]

103. The effects in Thailand were felt in different ways by comparison to India where most effects were related to domestic factors. Thailand's consumption of ODSs is small in comparison with world standards, but it has been steadily increasing.[58] Most of the increase in the use of these substances has been attributed to a rapid expansion of Japanese, European and United States firms operating wholly-owned subsidiaries or joint ventures with Thai firms. At this rate, the study indicates that Thailand may exceed its Annex A Protocol limit by 2005. Exceeding this limit may disqualify Thailand from being a beneficiary from the Multilateral Fund. Delaying the phase-out of ODSs, as was shown in the case of India, would substantially increase the incremental costs of compliance and at the same time lose the prospect of concessional funding to help defray the costs.

104. This example shows that differential phase-out schedules and the corresponding trade restrictions imply that firms located in countries already bound by a phase-out schedule may be motivated to relocate to an Article 5 country, such as Thailand, which has virtually no restrictions on ODSs consumption until 1999.[59] This is evidenced by the fact that new importers, particularly small subsidiaries of multinationals, have entered the market in recent years and demand for CFCs has surged.[60]

105. It has been reported that the Thai Government has entered into an understanding with the United States Environmental Protection Agency (EPA) and the Japanese Ministry of International Trade and Industry (MITI) that encourages multinational companies to apply the same schedule for their phase-out as their domestic operations. It is to be noted that according to this study solvents constitute 40 per cent of Thailand's CFC uses, and that up to 97 per cent of the solvents are used by Japanese and United States companies, and joint ventures.

106. Moreover, the study on Thailand shows that research and development is concentrated in large firms, while there appears to be a tendency for the small firms to obtain interim chemicals rather than to change processes. An additional concern is how the Thai economy will eventually adjust to the requirements of the Protocol. Key sectors such as the electronics industry must consider the overall feasibility of such shifts, including the composition of foreign versus domestic investment or small scale versus large scale firms. Foreign and large firms tend to be better placed to benefit from the funds under the Protocol.

107. In Colombia, the direct effects are likely to be small, but the indirect effects of the Protocol may be felt more strongly. For example, the industries which may be severely affected are not those which produce ozone-depleting substances, but those which rely on CFCs for refrigeration, including flowers, bananas and meat processing. Theoretically, these industries have until the year 2006 to adjust, but imports of ODSs will decline by 1995, because of the shutdown of American and European plants. Thus, the price of ODSs is likely to increase

and so will the costs of refrigeration, perhaps leading to an increase in the price of fruit.[41] Of greater significance are the limits on methyl chloroform for fumigation of food exports. In other cases, the Colombian study states that the impact of the Montreal Protocol on international competitiveness is not clear. While some firms may not be able to afford the new technology, there are funds available from the Parties to the Protocol to assist in the transition.

108. In the case of Poland, there are also a number of regional treaties that will influence its structure of industrial and agricultural production and hence its foreign trade. The Convention for the Protection of the Marine Environment in the Baltic sea will result in increased fees for water intake and sewerage discharge, thus affecting the exports of goods such as artificial fibres, pulp and paper, coke, sulphuric acid etc. At the same time, Poland will have to import a large number of water recycling plants. With regard to transboundary air pollution, the so-called Black Triangle Agreement (between Poland, the former Czechoslovakia and Germany) has resulted in reduced sulphur emissions from power stations, the costs of which are reflected in higher prices and lower exports of electricity from Poland.

109. The Basel Convention may also have effects on competitiveness. For example, restrictions on trade in scrap have potential effects on the steel industry. For steel mills using scrap as a secondary raw material, restrictions on trade may increase costs. On the other hand, in countries which currently export scrap, using scrap instead of iron ore would require an across-the-board replacement of technologies.[42]

Conclusion

110. Trade flows have been affected by some MEAs, either directly or indirectly. The extent of trade and competitiveness effects pursuant to the signing of an MEA calls into question whether existing compensating measures, such as funding and technology transfer, are sufficient to ensure that the development process of poor countries is not impaired. More research is required to analyse and evaluate the trade and competitiveness effects of MEAs, particularly with regard to their effects on small firms. In addition, there may be a need to make interim evaluations of MEAs. There is a need to further examine such effects, particularly in negotiating future MEAs.

PART C: CONCLUSIONS AND RECOMMENDATIONS

111. The link between environmental policies and competitiveness is a complex one. Empirical analyses suggest that environmental standards and regulations in developed countries have not as yet had significant effects on competitiveness. They may, however, have a greater effect on the competitiveness of developing countries. For both groups of countries, the effects on competitiveness of similar environmental regulations or standards can be negative in the short run, but may be less significant, and can even be positive, in the long run. The ability of firms to absorb adverse competitiveness effects depends on factors such as the rate of growth and the openness of the economy, and on their capacity to generate innovative responses to environmental policies. In the case of developing countries, fostering a climate for innovation is easier if they have already embarked on a path of sustained growth.

112. While the impact of environmental policies on competitiveness depends on a variety of factors, Governments may nevertheless be faced with claims that environmental policies may worsen the competitiveness of domestic firms or industries compared to firms in countries where standards are lower or not enforced. Such claims have indeed led to calls by environmental groups and others for measures to "level the playing field". On the other hand, there are legitimate reasons for diversity in environmental regulations across countries. Moreover, such calls for levelling the playing field overlook the fact that, even if countries were to attain similar levels of environmental quality, the cost would vary from country to country. Thus "environmental" countervailing duties,

or similar measures, against products from a country with lower abatement costs may simply be protecting an inefficient industry. Such measures, moreover, would be inconsistent with the rules of the WTO.

113. Empirical analysis of the factors affecting the link between environmental policies and competitiveness also shows that the same measure may affect two countries differently and that the competitiveness effects of external environmental policies may be relatively more onerous than those of domestic policies. Generally speaking, considerations about competitiveness have not prevented the implementation of domestic environmental policies, partly because the latter can be tailored to accommodate domestic concerns and technology is generally available to address these problems.

114. Country studies undertaken under UNCTAD's technical cooperation programme on trade, environment and development reveal that the overall competitiveness effects of environmental policies, both domestic and external, depend on a number of factors such as the composition and destination of exports, the firm size, availability of raw materials, the growth and the openness of an economy and information and transaction costs arising from variations in environmental regulations across countries, industrial restructuring, and innovation. In the context of increased globalization and trade liberalization, openness was found to play an important role in the link between environmental policies and competitiveness. The more open the economy the better is its access to information, inputs and technology. Increased openness implies greater commercial and investment links with countries with stringent standards, leading to greater diffusion of environmental standards to developing countries. Openness may also involve increased competition in domestic markets and consequently encourage cost effective solutions to environmental problems. Import liberalization, moreover, which normally accompanies openness, may relieve some of the pressures on domestic resources, although there are some cases where negative environmental consequences have been reported. On the other hand, if environmental policies act in effect as non-tariff barriers to trade, then the net effect of increased openness on market access and competitiveness could be negative.

115. Another interesting point that emerged from the country case studies is the importance of firm size. The effects of environmental policies, particularly those of a developing country's trading partners, vary between large and small firms. Small firms are more likely to be adversely affected than large firms because of poorer access to information, raw materials, capital and technology. Moreover, the economic use of environmentally sound technologies may require a minimum scale of operation, often beyond that of small firms. This raises important policy questions: whether and how small firms could be provided with more assistance; whether environmental policies may lead to industrial restructuring, and whether that is socially desirable. It also suggests that special measures may be needed to promote innovation in small firms.

116. The report also shows that the competitiveness effects of environmental policies depend to a large extent on structural factors. In making environmental policies effective and in addressing their competitiveness effects, it would therefore seem necessary to give due attention to such factors, a number of which would go hand in hand with economic development. For example, in developing countries investments in sanitation, in the provision of clean water and in education are more likely to produce higher marginal returns for the environment than investments in reducing industrial emissions. Thus, insisting that specific process-related environmental standards be met by exports from developing countries might take more resources away from more pressing development needs with larger environmental returns both at the local and at the global level.

117. On MEAs, the tentative conclusion appears to be that international conventions may have significant effects on the trade and competitiveness of developing countries. Compensatory mechanisms, such as financial and technological transfers, are needed to induce compliance with the obligations undertaken by developing countries. These treaties are voluntarily entered into and it may be possible for groups of countries which are affected in a similar

fashion by these provisions to negotiate suitable terms. In any event, more research is required to establish what these trade impacts and competitiveness effects are before any negotiations are undertaken.

118. The discussion on eco-taxes and border tax adjustments and trade in domestically prohibited goods (DPGs) has highlighted the need for more empirical analysis. The use of economic instruments such as environmental taxes is likely to increase in the future, particularly in the OECD countries. More research is needed on their applicability in developing countries, as well as on the possible trade and competitiveness effects of border tax adjustments. On the issue of DPGs, additional research is needed at the country level to enable countries to make a cost benefit analysis of permitting the import of such goods. In this context, future case studies undertaken under UNCTAD's technical cooperation programmes could include both the issue of border tax adjustments and trade in DPGs.

119. Environmental policies may be insufficient to generate significant environmental protection in developing countries, unless they are accompanied by economic development. To promote environmental protection without affecting the growth prospects of developing countries requires both national and international initiatives. National policies should be directed at fostering a climate of innovation, openness and capacity building to promote the more effective implementation of domestic environmental policies. International initiatives should aim at mitigating adverse trade and competitiveness effects of environmental policies. Measures to promote better market access, information sharing, and increased access to knowledge, technology and finance should be encouraged at the international level.

120. International cooperation is also required to enable countries to move towards higher environmental standards. Export diversification of both products and markets may result in reduced dependence on a few products and in the export of higher value added products, thus making it easier to internalise environmental externalities. Cooperative efforts between importing and exporting countries should be encouraged, particularly with a view to diversifying exports from developing countries. Transparency, technical cooperation and better dissemination of information on standards and requirements at both the national and international levels will mitigate the cost of obtaining information, particularly for small firms. It will also facilitate the process of adaptation to national and international standards. Finally, more research is required to develop innovative funding mechanisms.

Notes

1. Report of the Ad Hoc Working Group on Trade, Environment and Development on its first session (TD/B(41(2)/5, TD/B/WG.6/3, Annex I). In accordance with its terms of reference the Working Group will "examine the effects of environmental policies, standards and regulations on market access and competitiveness, in particular of the developing countries, especially the least developed among them, and countries in transition, taking into account the financial and technological implications". It is to be noted that the Trade and Development Board, at the first part of its forty-first session examined "The impact of environment-related policies on export competitiveness and market access" (UNCTAD, "The impact of environment-related policies on export competitiveness and market access", TD/B/41(1)/4 and "Statistical and information Annex" TD/B/41(1)/4.Add.1).

2. See Decision of the Commission on Sustainable Development contained in its report on the second session, chapter 1, sub-section A.4 ("trade, environment, and sustainable development").

3. Consumption externalities primarily stem from the usage and disposal of products. Examples of regulations or standards used to address consumption externalities include those relating to the phosphate content of detergents, the use of lead-free petrol in cars etc. Production externalities stem from the process of production. Regulations and standards used to address them include emission limits, ambient standards, etc.

4. See Carbaugh, R., and D.Wassink, "Environmental Standards and International Competitiveness", in World Competition: Law and Economics Review.

5. See Porter, M.E., and Claas Van Der Linde, 1994, "Towards a New Conception of the Environment-Competitiveness Relationship".

6. Lipsey, R.G., 1994, "Sustainable Growth, Innovation, Competitiveness, and Foreign Trade", background paper for the Traditional Institute on Innovation, Competitiveness and Sustainability, Whisler, B.C., Canada.

7. Ibid.

8. So far most of the country case studies under the UNCTAD/UNDP project have not examined these issues. However, at a meeting of the steering group at which members of the WTO, UNEP and OECD secretariats were also present, it was felt that the country case studies should also look into issues such as the use of economic instruments and trade in domestically prohibited goods.

9. To quote Verbruggen "to gather information and to obtain cooperation instead of obstruction, the government has hardly any choice but to go for a consultation with the industry involved". See Verbruggen H., 1993, "The Trade Effects of Economic Instruments", Paper prepared for the OECD Environment Directorate/NACEPT Trade and Environment Committee, Informal Experts Workshop on Environmental Policies and Industry Competitiveness, 28-29 January, Paris.

10. The exact description of the item in the terms of reference of the working group is: "to identify and analyze emerging environmental policy instruments with a trade impact, bearing in mind the need for international cooperation towards ensuring transparency and coherence in making environmental and trade policies mutually supportive".

11. Hoerner, J.A., 1994, Tax Tools for Protecting the Atmosphere: The US Ozone-Depleting Chemicals Tax, A case study prepared for the International Institute for Sustainable Development, Winnipeg, Canada, June 1994.

12. The Uruguay Round has amended the Agreement on Subsidies which now states that taxes on "energy, fuels, and oil used in the production process and catalysts which are consumed in the course of their use to obtain exported products" can be adjusted at the border.

13. GATT Article III reads as follows: " The contracting parties recognize that internal taxes and other internal charges... should not be applied to imported or domestic products so as to afford protection to domestic production".

14. See Sorsa, P., 1995, Environmental Protectionism, North-South Trade, and the Uruguay Round, Paper prepared for the Symposium "The World Economy after the Uruguay Round with Some Implications for Austria", organized by the Research Institute for European Affairs, University of Economics and Business Administration, Vienna, November 3-4, 1994.

15. See Vincent, J,R., 1993, "Reducing Effluent While Raising Affluence: Water Pollution Abatement in Malaysia", Study prepared for the Harvard Institute for International Development.

16. Information on such products is contained in United Nations, Consolidated list of Products Whose Consumption and/or Sale Have Been Banned, Withdrawn, Severely Restricted or Not Approved by Governments (Sales publication No. E.94.IV.3).

17. See, GATT secretariat's background report on Exports of Domestically Prohibited Goods for the sub-committee on Trade and Environment. PC/SCTE/W/7, 22 December 1994.

18. See, Hackmann, J., 1994, "International Trade in Waste Materials", in Review of International Trade and Development, November/December 1994; vol.29.

19. See Gaviria, D., R. Gomez, L. Ho, and A. Soto, 1994, Reconciliation of trade and environmental policies: the case study of Colombia, Study carried out under the joint UNCTAD/UNDP project on Reconciliation of environmental and trade policies.

20. PIC refers to the principle that international shipments of chemicals including pesticides that are banned or severely restricted in order to protect human health or the environment should only proceed with the explicit agreement of the national authority in the participating importing country. The PIC procedure includes certain pesticide formulations that are actively toxic. Until the time of drafting this report, 127 member countries had designated nations authorities to be responsible for the operation of PIC. Compilations of import decisions are forwarded to participating countries biannually. FAO and UNEP are preparing a draft legally binding instrument on the operation of the PIC in order to make the presently voluntary, non-binding PIC procedure more effective. The conclusion of a PIC Convention is envisaged for 1997.

21. In 1992, the European Community adopted Council Regulation EEC/2455/92, whereby exporters of chemicals which are banned or severely restricted in the EU must provide information to importing countries about these chemicals. In addition, it implements the UNEP/FAO international Prior Informed Consent scheme in the Community.

22. Markandya, A., 1994, "Reconciliation of Environmental and Trade Policies: Synthesis of Country Case Studies". UNCTAD, Geneva.

23. Chudnovsky,D., G. Lugones and M. Chidiak, 1995, Comercio Internacional y Medio Ambiente: el Caso Argentino, study prepared under the joint UNCTAD/UNEP project on Capacity-building on Trade and Environment. The study was also funded by project ARG/90/014, Ministerio de Relaciones Exteriores, Comercio Internacional y Culto.

24. De Motta Veiga, P., M. Reis Castilho and G. Ferraz Filho, 1994, Relationships between Trade and the Environment: the Brazilian Case, Study carried out under the joint UNCTAD/UNDP project on "Reconciliation of Environmental and Trade Policies".

25. Intal, P., E. Medalla, M. de Los Angeles, D. Israel, V. Pineda, P. Quintos and E. Tan, 1994, Trade and Environment Linkages: The Case of the Philippines, Study carried out under the joint UNCTAD/UNDP project on Reconciliation of Environmental and Trade Policies.

26. Fiedor, B., S. Czaja, A. Graczyk, and J. Rymarczyk, 1994,Linkages Between Environment and Trade: A Case Study of Poland, Study carried out under the joint UNCTAD/UNDP project on Reconciliation of Environmental and Trade Policies.

27. See De Motta Veiga, op. cit.

28. For shellfish the costs of an effluent treatment plant for the fish processing industry, introduced for domestic reasons, would have a very small cost (0.2 percent of turnover). Parikh J., V. Sharma, U. Ghosh and M. Panda, 1993, Trade and Environment Linkages: A Case Study of India. Study carried out under the joint UNCTAD/UNDP project on Reconciliation of Environmental and Trade Policies.

29. Aruoba C. et al., 1993, Impact of Environmental Regulations and Standards in European and North American Markets on Turkish Exports. Report 1: Environment-Trade Link. Second Draft; Report 2: Trade-Environment Link. First Draft, UNCTAD, Geneva. Study carried out under the joint UNCTAD/UNDP project on Reconciliation of Environmental and Trade Policies.

30. Poland may find its competitiveness being eroded because of its current inability to meet stricter standards if it is to become a member of the EU. The cost of meeting EU standards is considerable: according to one estimate it amounts to $30 billion.

31. Fiedor et al, op. cit.

32. Chudnovsky et al, op. cit.

33. Lu R., Y. Xia, J. Li, J. Zhang and Y. Lu (1993), A Study on Environmental and Foreign Trade Development in China. Draft study carried out under the joint UNCTAD/UNDP project on Reconciliation of environmental and trade policies.

34. Traditional exports representing 44 percent of total exports are oil, coffee, coal and ferro nickel. Nontraditional exports are fruits, flowers, fish, textiles, leather, chemicals and plastics, and resin.

35. De Motta Veiga et al, op. cit.

36. See TD/B/WG.6/5.

37. See Alleyne et al, op. cit.

38. See Bharucha, V., 1994, "Impact of Environmental Standards and Regulations on India's Exports", Report prepared for the Project RAS/92/034 on Institutional Capacities for Multilateral Trade.

39. See Bharucha, op.cit and De Motta Veiga, op.cit.

40. See TD/B/WG.6/5.

41. See Aruoba et al, op. cit.

42. See Chudnovsky et al, op. cit. and Parikh et al, op. cit.

43. See Faeth, P., 1995, Methods for Economic Analysis of Agricultural Sustainability, A paper sponsored by the United Nations Environmental Protection Programme and presented at the UNCTAD Expert Group Meeting on Internalization of Environmental Externalities, Geneva, 13-14 February 1995.

44. Alleyne, D., I. Boxill and A. Frances, 1995, "Environment and Trade: Case Study of Jamaica". Draft study carried out under the joint UNCTAD/UNDP project on Reconciliation of environmental and trade policies.

45. See TD/B/WG.6/5.

46. See Bharucha, op.cit.

47. Bharucha, op.cit.

48. Achanta A., P. Dadhich, P. Ghosh and L. Noronha, 1994, Requirements of Environmentally Sound Technologies (EST) to India for Compliance with Environmental Standards and Regulations in OECD Countries. Tata Energy Research Institute, Delhi, prepared for UNCTAD-TERI, New Delhi.

49. Aruoba et al, op. cit.

50. Lu R. et al, op.cit.

51. A number of developing countries listed under Article 5 of the Montreal Protocol qualify for technical and financial assistance.

52. Intal et al, op. cit.

53. Fiedor et al, op. cit.

54. Nkomo J., B. Zwizwai, and D. Gumbo, 1994, Trade and the Environment: Zimbabwe Case Study. Draft study carried out under the joint UNCTAD/UNDP project on Reconciliation of Environmental and Trade Policies.

55. See Bharucha, op.cit.

56. These figures may be revised downwards because of benefits arising from technological change and from innovation.

57. See Bharucha, op.cit.

58. In 1991, Thailand's per capita consumption of the controlled substances was as follows: Annex A 0.16 kg and Annex B 0.02 kg. These quantities are comfortably below the Protocol limits of O.3 kg and 0.2 kg respectively. Phantumvanit D., S. Wigzell, E. Natapon Buranakul, N. Boontherawara, and R. Bowonwiwat, 1994, The Interlinkages Between Trade and Environment: Thailand. Draft study carried out under the joint UNCTAD/UNDP project on Reconciliation of Environmental and Trade Policies.

59. Developing countries are eligible for assistance under the Financial Mechanism and are referred to as "Parties operating under paragraph 1 of Article 5".

60. Ibid.

61. Gaviria et al, op.cit.

62. De Motta Veiga, op. cit.